AC

PATENT COOPERATION TREATY

RESPONSIBLE OFFICER	
DUE DATE	
- 5 APR 2004	PCT

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INVOICE RECORDED				

From the INTERNATIONAL SEARCHING AUTHORITY

INVITATION TO PAY ADDITIONAL FEES

(PCT Article 17(3)(a) and Rule 40.1)

31 MAY 2005

To:
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Date of mailing *(day/month/year)* 29/03/2004

Applicant's or agent's file reference
IP/P3309/WOD

PAYMENT DUE within 30 ~~months~~/days from the above date of mailing

International application No.
PCT/GB 03/05287

International filing date *(day/month/year)* 04/12/2003

Applicant
QINETIQ LIMITED

1. This International Searching Authority

(i) considers that there are 4 *(number of)* inventions claimed in the international application covered by the claims indicated ~~below~~/on the extra sheet:

and it considers that the international application does not comply with the requirements of unity of invention (Rules 13.1, 13.2 and 13.3) for the reasons indicated ~~below~~/on the extra sheet:

(ii) [X] has carried out a partial international search (see Annex) [ ] will establish the international search report on those parts of the international application which relate to the invention first mentioned in claims Nos.:

see annex

(iii) will establish the international search report on the other parts of the international application only if, and to the extent to which, additional fees are paid

2. The applicant is hereby **invited,** within the time limit indicated above, to pay the amount indicated below:

EUR 945,00 (Fee per additional invention) x 3 (number of additional inventions) = EUR 2.835,00 (total amount of additional fees)

Or, _____ x _____ = _____

The applicant is informed that, according to Rule 40.2(c), **the payment of any additional fee may be made under protest,** i.e., a reasoned statement to the effect that the international application complies with the requirement of unity of invention or that the amount of the required additional fee is excessive.

3. [ ] Claim(s) Nos. _____ have been found to be unsearchable under Article 17(2)(b) because of defects under Article 17(2)(a) and therefore have not been included with any invention.

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Authorized officer
Patricia Klingens-Herklots

Form PCT/ISA/206 (July 1992)

INVITATION TO PAY ADDITIONAL FEES

International application No.
PCT/GB 03/05287

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1,2,3,7 to 11(when depending on claim 2),16,17,19, 21

System and method for determining a mask used in video image stabilisation

2. Claims: 4,5,7 to 11(when depending on claim 4)

Video image stabilisation system with reduced calculation effort

3. Claims: 6,7 to 11(when depending on claim 6),18

Processing of global motion vector in a video image stabilisation system

4. Claim : 12 to 15

Processing of global motion vector in a video image stabilisation system

The separate inventions/groups of invention are:

Claims: 1,2,3,7 to 11(when depending on claim 2),16,17,19,21
System and method for determining a mask used in video image stabilisation

Claims 4,5,7 to 11(when depending on claim 4)
Video image stabilisation system with reduced calculation effort

Claims 6,7 to 11(when depending on claim 6),18
Processing of global motion vector in a video image stabilisation system

Claims Displaying an output image in a video image stabilisation system

They are not so linked as to form a single general inventive concept (Rule 13.1 PCT) for the following reasons:

1.The document D1 (= EP560610) discloses a video image stabilisation system (see column 5, line 10 to column 8, line 5) for correction of camera motion, that is arranged to receive one or more signals representative of a plurality of images from an image source wherein, for an image n following at least an image (n -1) and an image (n -2) the system is arranged to estimate a Global Motion Offset (GMO) value between image n and a previous image representative of the spatial separation between the scene imaged in image n and the previous image, and apply a corrective movement to the image n based upon this GMO. Said known video image stabilisation system further is arranged to estimate the GMO for the image n with reference to a mask that represents a region or regions of the image n not to be considered in the GMO

estimation, the region(s) being region(s) estimated as likely to mislead the estimation of the GMO (see figure 3; column 6, line 46 to column 7, line 20) as defined in claim 1.

2.The subject-matter of claim 2 differs from the known video image stabilisation system in that the system is arranged to examine one or more local regions of the image n and corresponding local regions of a previous image, and estimate a local motion offset (LMO) representative of spatial separation between like features in corresponding local regions of the current and previous images, and if the, or each, LMO is greater than a given threshold, to set area(s) of the mask that correspond to this local region or regions to indicate omission from the GMO estimation.
Said first special technical feature allows to determine the mask values in order to remove from the relevant calculations pixels connected to local motion effects.

3.The subject-matter of claim 4 differs from the known video image stabilisation system in that the system is arranged to estimate the GMO of an image representative of image n but having a spatial resolution lower than image n.
Said second special technical feature allows to reduce the calculation efforts.

4.The subject-matter of claim 6 differs from the known video image stabilisation system in that the system is arranged to adjust the GMO if a stationary camera state is detected, this state being indicated by means of a plurality of contiguous GMOs including the current GMO all being below a given threshold.
Said third special technical feature allows to prevent an erroneous action of the stabilisation system with a video camera being in a stationary state.

5.The subject-matter of claim 12 differs from the known video image stabilisation system in that he system is arranged to generate a border on at least one edge of the image n, the border being adjustable in size such that it covers any blank space between the edge of image n and the corresponding edge of a display area on which the image n is displayed.

The subject-matter of claim 15 differs from the known video image stabilisation system in that the system is arranged to scale the image n, such that it covers any blank space between the edge of image n and the corresponding edge of a display area on which the image n is displayed.

Said fourth respectively fifth special technical feature allows to hide rapidly moving edges of the stabilised images from view when displayed on a screen.

6.The subject-matter of claim 16 differs from the known video image stabilisation system in that anomalous pixels of the image n are used to set corresponding pixels of the mask such that they are excluded from the estimation of the GMO.
Said sixth special technical feature allows to determine the mask values in order to remove from the relevant calculations pixels having

anomalous output values.

7.The subject-matter of claim 18 differs from the known video image stabilisation system in that the system is arranged to multiply the calculated GMO, as adjusted in any other operation, by a decay constant factor lying between 0 and 1 before shifting the image n.
Said seventh special technical feature allows to prevent accumulation of final stabilisation offset vectors even if the requirements for such an offset has ended.

8.The document D1 discloses further a method of stabilising a present image relative to at least one previous image where both current and previous images are part of a sequence of video images represented by an electronic signal (see column 5, line 10 to column 8, line 5), comprising the steps of:
i. estimating a global motion offset (GMO) between the current and previous image representative of the spatial separation between the scene imaged in the current image and that imaged in the previous image; and
ii. applying a corrective movement to the current image based upon the GMO.
In the known method a mask image is used in estimating the GMO, the mask image
representing a region or regions of the current image not to be considered in the GMO estimation, the region(s) being region(s) being estimated as likely to mislead the estimation of the GMO (see column 6, line 46 to column 7, line 20) as defined in claim 19.

9.The subject-matter as claimed in claim 20 differs from the known method by further including the step of examining one or more local regions of the current image and corresponding local regions of a previous image, and estimating a local motion offset (LMO) representing the spatial separation between like features in corresponding local regions of the current and previous images, and if the, or each, LMO is greater than a given threshold, setting area(s) of the mask that correspond to this local region or regions to indicate omission from the GMO estimation.
Said eighth special technical feature corresponds to the first special technical feature.

Said sixth special technical feature corresponds to the first special technical feature, since it is also concerned with the determination of the mask.

10.Moreover the third and seventh special technical features are considered to be corresponding since both relate to processing of the GMO in order to prevent erroneous actions of the stabilisation system.

11.Considering the cited prior art and by comparison of the special technical features as analysed above, no technical relationship among said four inventions can be found involving common or corresponding special technical features, as these inventions appear to relate to different problems and consequently different inventive concepts in the context of video image stabilisation.

In conclusion, the International Searching Authority is therefore of the opinion that at least four different inventions are claimed in the present application, which do not represent a group of inventions so linked as to form a single general inventive concept as required by Rule 13.1 PCT.

Annex to Form PCT/ISA/206
COMMUNICATION RELATING TO THE RESULTS
OF PARTIAL INTERNATIONAL SEARCH

International Application No
PCT/GB 03/05287

1. The present communication is an Annex to the invitation to pay additional fees (Form PCT/ISA/206). It shows the results of the international search established on the parts of the international application which relate to the invention first mentioned in claims Nos.:
1-3,7-11,16,17,19-21

2. This communication is not the international search report which will be established according to Article 18 and Rule 43.

3. If the applicant does not pay any additional search fees, the information appearing in this communication will be considered as the result of the international search and will be included as such in the international search report.

4. If the applicant pays additional fees, the international search report will contain both the information appearing in this communication and the results of the international search on other parts of the international application for which such fees will have been paid.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 560 610 A (CANON KK) 15 September 1993 (1993-09-15)	1,19,21
A	column 1, line 48 -column 2, line 3 column 5, line 10 -column 8, line 5	2,3
A	EP 1 117 251 A (EASTMAN KODAK CO) 18 July 2001 (2001-07-18) paragraph '0015! - paragraph '0034! paragraph '0007! - paragraph '0011!	1-3,19, 21

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

1

Patent Family Annex

Information on patent family members

International Application No
PCT/GB 03/05287

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0560610 A	15-09-1993	JP 3209785 B2	17-09-2001
		JP 5257196 A	08-10-1993
		JP 3199834 B2	20-08-2001
		JP 5289159 A	05-11-1993
		DE 69322423 D1	21-01-1999
		DE 69322423 T2	02-06-1999
		EP 0560610 A2	15-09-1993
		US 5731849 A	24-03-1998
EP 1117251 A	18-07-2001	EP 1117251 A1	18-07-2001
		JP 2001197360 A	19-07-2001